AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1-15. (cancelled)

16. (new) Method for controlling the combustion process in a combustion engine, comprising at least one cylinder, at least one piston which reciprocates in the cylinder, and is set to reverse in the cylinder at an upper and lower dead center position, and at least one fuel feed device disposed in the cylinder, the method comprising:

injecting through said at least one fuel feed device a fuel mixture directly into the cylinder with high kinetic energy such that the fuel or the fuel mixture, on its way into the cylinder, forms a spray and is mixed with cylinder gas compressed in the cylinder forming a fuel/gas mixture;

igniting said fuel/gas mixture by compression heat generated in the cylinder only after an at least local mixing of fuel and cylinder gas has occurred;

wherein the spray, during the injection step, supplies kinetic energy and controls a spray-internal mixing process between the fuel, or the fuel mixture, and the cylinder gas, and supplies kinetic energy to a large-scale global mixing process; and

supplying further kinetic energy to the spray-internal and to the global mixing process as a result of the motion and/or design of the piston.

17. (new) The method according to claim 16, further comprising controlling essentially independently of each other soot and nitrogen oxide emissions generated during the combustion process and the efficiency of the engine, the soot emissions being primarily controlled by the quantity of supplied kinetic energy to the mixture, the nitrogen oxide emissions being primarily controlled by the quantity of exhaust gases from earlier combustion processes, and the efficiency being primarily controlled by the center of gravity in the combustion chamber and the duration of heat release.

18. (new) The method according to claim 16, wherein the gas compressed in the cylinder contains, for an optional quantity of nitrogen oxide emission, a certain proportion of exhaust gases from earlier combustion processes which have been recirculated to the cylinder in accordance with a variation in the oxygen content from about 21% down to about 15%.

19. (new) The method according to claim 16, wherein the injection pressure of the fuel feed device is higher than 300 bar.

20. (new) The method according to claim 19, wherein the injection pressure of the fuel feed device is between 1000 and 3000 bar.

21. (new) The method according to claim 16, further comprising controlling the injection pressure such that the injection pressure varies during the injection of the fuel or the fuel mixture into the cylinder.

22. (new) The method according to claim 16, wherein the fuel or the fuel mixture is injected such that the fuel or the fuel mixture, at the start of the injection, is injected at the maximum pressure generated during the entire injection.

23. (new) The method according to claim 16, wherein as a result of the motion and design of the piston, kinetic energy is supplied during an expansion phase, to the large-scale global mixing process.

24. (new) The method according to claim 16, wherein the fuel or the fuel mixture is injected through nozzles of round, elliptical, or other suitable shape having a size of about 0.05-0.40 mm.

25. (new) The method according to claim 16, wherein injection of the fuel or the fuel mixture into the cylinder is begun, when applied to a combustion engine with crankshaft, at a crankshaft angle of approximately 20° before to approximately 20° after the upper dead center position.

26. (new) The method according to claim 16, wherein the mixing is carried out locally, since fuel or the fuel mixture and the cylinder gas are mixed in regions upstream of the regions in

the spray where combustion takes place and since the injection continues after ignition has been realized.

27. (new) The method according to claim 26, further comprising controlling the local mixing during the injection period by the distance between the fuel feed device, and where the fuel/gas mixture principally burns, and said distance being controlled by the kinetic energy and the turbulence in the spray and the shape of the spray which leaves the fuel feed device, and by the content of exhaust gases in the cylinder which is recirculated to the cylinder from earlier combustion processes.

28. (new) The method according to claim 16, wherein the mixing is carried out globally since essentially the entire quantity of fuel corresponding to one combustion cycle is injected and mixed in the cylinder before ignition and combustion are realized.

29. (new) The method according to claim 16, wherein the gas motion is formed by the gas present in the cylinder being forced out through a gap between the periphery of a piston top and one end of the cylinder, when the piston is in the upper dead center position.

30. (new) The method according to claim 16, wherein a swirl motion is generated in the cylinder.

31. (new) The method according to claim 16, further comprising supplying further kinetic energy to the mixture through a post-injection.